DOCUMENT RESUME

ED 374 941 RC 019 799

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TITLE The Road to the Doctorate for California's Chicanas and Chicanos: A Study of Ford Foundation Minority Fellows. CPS Report.

INSTITUTION California Univ., Berkeley. California Policy Seminar.

PUB DATE 93

NOTE 60p.; Latina/Latino Policy Research Program. This full report is summarized in CPS Brief, v5 n16 Dec 1993, which has the same title (copy appended).

AVAILABLE FROM California Policy Seminar, 2020 Milvia Street, Suite 412, Berkeley, CA 94704 ($12, check payable to UC Regents).

PUB TYPE Information Analyses (070) -- Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.

DESCRIPTORS *Academic Aspiration; *College Faculty; *Doctoral Degrees; Educational Discrimination; *Educational Experience; Educational Policy; Fellowships; Higher Education; Mentors; *Mexican Americans; Parent Influence; Questionnaires; Secondary Education; Sex Differences; Student Motivation; Teacher Influence; Universities

IDENTIFIERS *California; Chicanas; Chicanos; *Ford Foundation

ABSTRACT

This report addresses the underrepresentation of Mexican-Americans in the faculties of U.S. universities. During the 11-year period from 1980 to 1990, a total of 91,837 women received doctorates from U.S. universities, and of these, 751 (0.7 percent) were Mexican-Americans. Of the 148,352 men who received doctorates during this period, 1,189 (also 0.7 percent) were Mexican-Americans. Other trends include critical underrepresentation of Mexican-Americans, especially females, in the fields of physical science, engineering, life science, humanities, education, and other professional fields. California undergraduate institutions produced the largest share of Mexican-American students who went on to receive doctorates; within the state, the California State University system produced the largest number of these future doctorates. Sixty-six scholars who were awarded the Ford Foundation Minority Fellowship were interviewed concerning family background and educational experiences. Respondents indicated that educational barriers included lack of preparation and skills, lack of financial support, lack of information on graduate school, lack of role models, family responsibilities, being stigmatized as an affirmative action student, and experiences with racial and gender discrimination. On the other hand, scholars spoke of positive mentoring relationships; research experiences; and encouragement from certain faculty, peers, and family. They noted that the single most important factor in obtaining a doctoral degree was a positive mentoring experience. Policy implications for public schools and universities are discussed. Contains 20 references, numerous tables, the survey questionnaire, and a summary that was published separately. (LP)

ED 374 941

CPS report

A Publication of the California Policy Seminar

THE CALIFORNIA POLICY SEMINAR IS A JOINT PROGRAM OF THE UNIVERSITY OF CALIFORNIA AND STATE GOVERNMENT

THE ROAD TO THE DOCTORATE FOR CALIFORNIA'S CHICANAS AND CHICANOS

A Study of Ford Foundation Minority Fellows

Daniel G. Solorzano

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A Study of Ford Foundation Minority Fellows

Daniel G. Solorzano

Latina/Latino Policy Research Program
University of California

California Policy Seminar
1993

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The Latina/Latino Policy Research Program is funded by the UC Office of the President in response to Senate Concurrent Resolution (SCR) 43 (1987), requesting that the university initiate efforts to address the problems facing the state's Latino population in such areas as health, education, employment, government participation, housing, welfare, etc.

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Author's Acknowledgments

The author wishes to thank the people who worked on his research team: project director Laura Romero, and research assistants Julie Mendoza, Lupe Anaya, Cesar Nava, Mini Arroyo, and David Victorin, as well as Eric Dey, who provided technical support. He also thanks his best friend and wife, Laura Telles.

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EXECUTIVE SUMMARY

By any standard used, Chicanas[1] and Chicanos are underrepresented in the faculties of U.S. universities. For years, scholars and policymakers have been commenting on the dismal future of minority faculty production. In fact, the next 10 years will provide an opportunity to increase minority appointments, as a large number of college faculty will be retiring. Although the key that opens one of the first doors to these faculty positions is the doctoral degree, little is known about Chicana and Chicano doctorate production generally and even less is known about production in the 1980s — when the faculties of the 1990s and the beginning of the 21st century were trained.

Other than a few seminal studies, there is little information on the resources, barriers, and critical events these Chicana and Chicano scholars meet on their road to the doctorate. Some recent research has identified factors that have affected the career paths of male and female Nobel prize recipients in science, of sociologists, of women psychologists, and of academics from the working class, but no research has focused primarily on minority, Latino, or Chicano scholars and only one study had a single Chicana case. Also, in recent years, some attention has centered on the graduate school experience of underrepresented minority groups. While a primary concern has been the declining enrollment of African Americans in graduate school (particularly males), little is known about Chicana and Chicano recruitment, admission, retention, and graduation at the doctoral level. A few studies have shown that Latinos are underrepresented in graduate school, but they provide no information by specific Latino subgroup.

This study is an attempt to remedy this oversight by meeting three objectives: 1) provide a national overview of Chicana and Chicano doctorate production in U.S. universities from 1980 to 1990; 2) explore California's role in producing these doctoral scholars by examining their baccalaureate origins and doctorate-granting institutions; 3) investigate a small sample of Chicana and Chicano doctoral students and postdoctoral scholars to explore the resources, barriers, and critical events they experienced on their road to the doctorate.

CHICANA AND CHICANO DOCTORATE PRODUCTION IN U.S. UNIVERSITIES

To meet the first objective, a national overview of Chicana and Chicano doctorate production in U.S. universities from 1980 to 1990 was developed using data from the Doctorate Records Project of the National Research Council (NRC). In the 11-year period from 1980 to 1990 a total of 91,837 women received doctorates from U.S. universities, and of those 751 (0.7 percent) were Chicanas. Of the 148,352 men who received doctorates

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[1] Latino is used as an umbrella term that includes all groups of Latin American-origin in the western hemisphere who are living in the United States as either U.S. citizens or permanent residents. Chicanas and Chicanos are defined as females and males of Mexican origin living in the United States as either U.S. citizens or permanent residents.

during the period, 1,189 (also 0.7 percent) were Chicanos. For comparative purposes, during this period Chicanas were 4.5 percent of the age 30–34 U.S. cohort and Chicanos were 5.0 percent.

Five additional patterns of Chicana and Chicano doctorate production are represented in the data:

- Both Chicano males and females are severely underrepresented in each of the broad fields of physical science, engineering, life science, social science, humanities, education, and selected professional fields.
- Although both males and females are concentrated in the fields of education, social sciences, and the humanities, males appear to be more widely dispersed throughout the six fields and professional schools than females.
- Chicanas are particularly underrepresented in each of these areas.
- During 1986-1990 the percentage of Chicanas receiving doctorates was higher (+14 percent) than it was during 1981-1985, while the percentage for Chicanos declined slightly (-4 percent). In contrast, the 30-34 Chicana age cohort grew by 76 percent from 1980 to 1990, while the Chicano cohort increased 92 percent. It should be noted, however, that these slight gains for women were relative to a very small base.
- Finally, depending on the field, it would take an increase in production of three to 17 times for both males and females to reach parity in terms of their proportion to the population in their age cohort.

It seems clear that Chicana and Chicano doctoral recipients are critically underrepresented in all fields.

Baccalaureate Origins and Doctorate-granting Institutions

California's role in producing Chicana and Chicano scholars was explored by examining where they earned their baccalaureate and doctoral degrees. Four patterns emerged from the NRC data: California undergraduate institutions produce the largest share of Chicano and the second-largest share of Chicana students who go on to receive doctorates; within the state, the California State University system produces the largest number of these future doctorates; California doctoral institutions produce the largest share of Chicana and Chicano students in the United States; though the largest institutions in California — state as well as private — produce the largest share of baccalaureates and doctorates, some smaller or less urban institutions are supplying more than their size and location would have predicted.

CHICANA AND CHICANO FORD FOUNDATION FELLOWS IN CALIFORNIA

To explore the resources, barriers, and critical events Chicana and Chicano scholars experienced on their road to the doctorate, the investigator examined a small group of scholars who were awarded one of the most prestigious and selective fellowships in the

United States: the Ford Foundation Minority Predoctoral, Dissertation, and Postdoctoral Fellowship.

The sample of 66 scholars provided a quantitative and qualitative portrait of the career paths of Chicanas and Chicanos through the educational pipeline. The respondents were primarily first-generation college students from working-class families who were born in the U.S. of parents who were U.S. citizens or permanent residents. They grew up in primarily bilingual Spanish/English homes during their elementary and high school years and attended public high schools, where they were in college preparatory programs.

One troubling finding was their frequent exposure to racial and gender discrimination during high school, college, and graduate studies, with women encountering greater discrimination than men at each of these educational points. Chicanas, moreover, experienced more frequent discrimination from teachers, counselors, administrators, and other students, and recounted disturbing accounts of racial and gender discrimination throughout their educational career.

Although these Chicana and Chicano students were a unique group of highly gifted scholars, they did not seem to get much encouragement from school personnel to go to college. Not surprisingly, given the findings above, the males seemed to get more encouragement to pursue higher education from both their teachers and fathers than did females.

Immediately after high school and during their undergraduate years, a large percentage of this group went to work part- or full-time. A sizable number of them mentioned their need to work to continue their studies. Sometimes, in fact, it was the hard work of manual labor and tedious jobs that pushed them into higher education. While many enrolled in four-year colleges immediately after high school, 45 percent of the men and 41 percent of the women in the sample attended a community college.

These scholars chose a particular undergraduate college because of the affordable tuition, financial aid package, friends going to college, and parental encouragement. Many in the sample changed majors at least once in their college career. When they finally settled on a major it was because they enjoyed the field, it fulfilled personal expectations, they excelled in coursework, they could explore ethnic and gender issues, and it prepared them for graduate school. Many of the respondents spoke of the positive experience of being involved in college student political organizations and minority student support programs.

As undergraduates, the barriers they had to overcome included their lack of preparation and skills, their difficulty with "weeder" or "filter" courses (i.e., those that students must take and pass with a certain grade to stay in the major), lack of financial support, lack of information on graduate school, lack of Chicana and Chicano role models, family responsibilities, being stigmatized as an affirmative action student, and experiences with racial and gender discrimination.

On the other hand, the scholars spoke of positive mentoring relationships, research experiences, and encouragement from certain faculty, peers, and family as resources needed to finish their baccalaureate studies and continue on to graduate school.

Informants mentioned that they attended graduate school in order to grow intellectually, make a contribution to the field, contribute to the advancement of minorities and women, and attain occupational mobility.

Although their major sources of financial support during the coursework and dissertation stages of their graduate years came from scholarships, grants, loans, and work, only about four out of 10 of the subjects were engaged in what many feel is the most critical experience in graduate school: research assistantships.

When asked what they perceived to be the most important factors in obtaining a doctoral degree, the scholars cited university and other financial support, faculty advice on research and dissertation topics, and encouragement from fellow peers and their spouses. The single most important factor, however, was a positive mentoring experience. For many, this mentoring occurred among fellow students. Many also mentioned the opportunity to do hands-on research as another important factor in finishing their doctoral work. Finally, respondents spoke of their sense of indebtedness to scholars who preceded them in their fields and activists who came before them.

In contrast, the factors that most greatly interfered with their graduate work were burnout, personal problems, and lack of support from their dissertation chair. A number of both female and male Fellows mentioned their advisor, other faculty, or the department's refusal to recognize the legitimacy of their research as a major barrier they had to overcome in their graduate years.

POLICY RECOMMENDATIONS

The following policy recommendations start from three basic premises:

1. One goal of social policy is to help the less fortunate and less powerful to achieve equity in society.

2. In a society that values truth and its pursuit, the inclusion of students and faculty with new ideas will not only benefit the Chicana and Chicano community, but will help in the expansion of knowledge and ultimately in California's social and economic development.

3. As meaningful interaction between people tends to break down interethnic and intergender stereotypes, positive interaction between faculty and Chicana and Chicano students at each stage in the educational pipeline is critical.

Implementation of the following recommendations would address the most significant resources and barriers that the Ford scholars voiced in the course of this study.

Recommendations for State Goals and Policy

- The state of California must recommit itself to increased high school graduation rates for Chicana and Chicano students.
- The state of California must recommit itself to recruiting, admitting, retaining, and graduating Chicana and Chicano students at all levels of higher education.
- The state of California must recommit itself to recruiting, retaining, and promoting Chicana and Chicano faculty in all segments of higher education.

Recommendations for High School, College, and Graduate School Programs to Implement Policy

High School

- In order to increase the number of high school students who continue on to college, the state should establish a Chicana and Chicano High School Research Assistant Program to get students interested in academic research as a possible career.

  As an incentive for their participation, high school faculty could be given pay differentials or stipends, class release time, and undergraduate or graduate student assistance. Moreover, high school students could be given a stipend, after-school and summer employment, and class credit.

- Make sure teachers and counselors are sensitive to strengths of Chicana and Chicano students and encourage them to consider college training for professional careers.
- Work with local colleges, community organizations, and businesses to expose students to college, professional careers, and role models. To that end, high school, community organizations, university, and business partnerships can be established to form after-school, Saturday, and summer research programs.
- Work with university outreach programs to provide college visitation trips throughout California.

Undergraduate College and University

- In order to increase the number of undergraduate students who continue on to graduate school, the state should establish a Chicana and Chicano Undergraduate Research Assistant Program at all three tiers of the California postsecondary education system.

  As few students enter college with the goal of becoming college professors, faculty who teach undergraduate students are critical in producing the next generation of PhDs. Although research is not the primary function of the community colleges, programs at this level are especially important because this is where the vast majority of Chicana and Chicano students begin their college career. As an incentive for their participation, faculty could be given course release time, seed money for research, reduced overhead costs for extramural grants, or graduate assistants. Students could be given a wage, stipend, fee waiver, course credit, or have their program participation acknowledged in the college transcript.

- Provide adequate financial aid assistance in scholarships, grants, loans, and work-study for Chicana and Chicano undergraduate students.
- It is important to nurture the development of student academic and social support networks both on and off campus. These could be social, political, and discipline-specific clubs.
- Develop a human relations program that helps dispel the myths and stereotypes of Chicana and Chicano students and their communities. In the short term, this can take the form of an ethnic and gender studies requirement for all students who graduate

from the university. However, in the long term, schools and departments must integrate their faculties and curricula with Chicana and Chicano professors, courses, content, and research.

Graduate School

- The state should establish a Chicana and Chicano Graduate Research Assistantship Program in each of the UC campuses to give more students the opportunity to conduct research and develop relationships with mentors.

  As an incentive for departments and faculty, a formula might be devised that attaches increased funds for fellowships and graduate assistants to the number of Chicana and Chicano students recruited to and graduated from each department. Also, intramural research grants could be awarded to faculty who have concrete plans to employ Chicana and Chicano students on their projects. Moreover, university overhead charges on extramural grants could be reduced for faculty with explicit plans to include these students.
- Supply students with adequate financial assistance, opportunities to present research at colloquia, opportunities to attend academic conferences, opportunities to form study and dissertation support groups, and support for the establishment of Chicana and Chicano graduate student organizations during the course-work and dissertation writing stages.
- Provide an academic and social climate in which research related to race, ethnicity, and gender is encouraged and supported. To that end, if applicable, schools must support minority group and gender research.
- Sensitize the faculty to Chicana and Chicano student issues. Affirmative efforts must be taken to destroy the myths and stereotypes about minority students and faculty.

We do not know what potential new knowledge has not been developed because of the exclusion of Chicanas and Chicanos from California's higher education system, but may begin to understand the scope of our loss once we make a genuine commitment to breaking down barriers, abolishing policies of exclusion, and building on the strengths of Chicana and Chicano students. This study and the related policy recommendations begin to address that process.

INTRODUCTION

By any standard used, Chicanas[1] and Chicanos are underrepresented in the faculties of U.S. universities. For years, scholars and policymakers have been commenting on the dismal future of minority faculty production. In fact, the next 10 years will provide an opportunity to increase minority appointments, as a large number of college faculty will be retiring. Although the key that opens one of the first doors to these faculty positions is the doctoral degree, little is known about minority doctorate production generally and even less is known about production in the 1980s — when the faculties of the 1990s and the beginning of the 21st century were trained.

What we know about Chicana and Chicano doctorates comes from Gándara's (1979, 1982) examination of 17 Chicana and 28 Chicano PhDs, JDs, and MDs; Simoniello's (1981) observation of eight professional women; Morales's (1988) and Achor and Morales's (1990) study of 100 Chicana doctorates; and Cuadraz's (1992) investigation of 10 Chicana social science doctorates at one institution. Gándara's 1979 investigation of 28 men is the only study of Chicano males and, to date, no other research has been conducted on the career paths of Chicana scholars.

Although some recent research has identified factors that have affected the career paths of male and female Nobel prize recipients in science, of sociologists, of women psychologists, and of academics from the working class, no research has focused primarily on minority, Latino, or Chicano scholars and only one study had a single Chicana case.[2] A primary concern of the attention centered on the participation of underrepresented minority groups in graduate school in recent years has been the declining enrollment of African Americans (particularly males). Little is known about Chicana and Chicano recruitment, admission, retention, and graduation at the doctoral level. The few studies showing that Latinos are underrepresented in graduate school provide no information by specific Latino subgroup. There is almost no information on Chicanas in the doctoral pipeline, for example, and even less is known about the resources, barriers, and critical events that Chicana/o students meet on their road to the doctorate.

This study attempts to remedy this oversight by meeting three objectives. First, the report provides a national overview of Chicana and Chicano doctorate production in U.S. universities from 1980 to 1990. Second, it studies California's role in producing these doctoral scholars by examining their baccalaureate origins and doctorate granting institutions. Third, it investigates a small sample of Chicana and Chicano doctoral students and postdoctoral scholars to explore the resources, barriers, and critical events they experienced on their road to the doctorate.

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[1] For this study, the term Latino is used as an umbrella term that includes all groups of Latin American origin in the Western hemisphere who are living in the United States as either U.S. citizens or permanent residents. Chicanas and Chicanos are defined as females and males of Mexican origin living in the United States as either U.S. citizens or permanent residents.

[2] See Berger (1990), McGrayne (1993), O'Connell and Russo (1983, 1988, 1990), Riley (1988), Ryan and Sackrey (1984), and Zuckerman (1977).

CHICANA/O DOCTORATE PRODUCTION IN U.S. UNIVERSITIES

To meet the first objective, a national overview of Chicana and Chicano doctorate production in U.S. universities from 1980 to 1990 was developed using data from the Doctorate Records Project of the National Research Council (NRC).[3] In the 11-year period from 1980 to 1990 a total of 91,837 women received doctorates from U.S. universities and, of those, 751 (0.7 percent) were Chicanas (Solorzano, 1992). Of the 148,352 men who received doctorates during the period, 1,189 (also 0.7 percent) were Chicanos (see Table 1). For comparative purposes, during the period Chicanas were 4.5 percent of the age 30-34 U.S. cohort and Chicanos were 5.0 percent (U.S. Bureau of the Census, 1983, 1992).

Five additional patterns of Chicana and Chicano doctorate production are represented in the data:

- Both the males and females are severely underrepresented in the broad fields of physical science, engineering, life science, social science, humanities, education, and selected professional fields.
- Although both the females and males are concentrated in education, social sciences, and the humanities, the males appear to be more widely dispersed throughout these fields than females.
- In comparison with males, Chicanas are underrepresented in each of the fields.
- From 1986 to 1990 the percentage of Chicanas receiving doctorates was higher (+14 percent) than it was during the previous five years, while the percentage for Chicanos declined slightly (-4 percent). In contrast, the 30-34 Chicana age cohort grew by 76 percent from 1980 to 1990, while the Chicano cohort increased 92 percent (U.S. Bureau of the Census, 1983 and 1992). However, it should be noted that these slight doctoral gains for women were relative to a very small base.
- Finally, depending on the field, it would take an increase in production of three to 17 times for Chicanas and Chicanos to reach parity in terms of their proportion to the age cohort population.

Baccalaureate Origins[4]

Undergraduate colleges and universities in the five southwestern states of California, Texas, New Mexico, Arizona, and Colorado produce six to seven out of every 10 doctorates ultimately earned by Chicanas and Chicanos. Moreover, California institutions produce the largest share of Chicano and the second-largest share of Chicana students who go on to receive doctorates. Within

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[3] Special computer runs for this study were conducted by the National Research Council's Doctorate Record Project using the Survey of Earned Doctorates (SED). In the SED, Chicanos were not identified separately prior to 1975. Moreover, from 1975 to 1979 there were inconsistencies in the way Chicanos were accounted for. Therefore, the most consistent data on Chicano doctorate production is from 1980 to the present.

[4] The baccalaureate origin is the undergraduate institution of the doctorate recipient. Because the NRC insists on confidentiality, only institutions that produced three or more persons who went on to complete the doctorate from 1980 to 1990 were included in the tables.

Table 1. Number and Percentage of Chicana/o Doctorate Recipients by Broad Field: Cumulative from 1980 to 1990

	Number[1]	Percent[2]	Percent[3]	Percent[4]	% Change[5]	Parity Index[6]
FEMALES						
Physical Science	23	0.4	3.1	18.0	+167	0.09
Engineering	12	0.7	1.6	16.2	+167	0.16
Life Science	66	0.4	8.8	34.2	+ 60	0.09
Social Science	190	0.8	25.3	40.2	+ 43	0.18
Humanities	87	0.6	11.6	36.6	- 3	0.13
Education	349	1.4	46.5	46.7	- 8	0.31
Professional	24	0.4	3.2	27.6	- 15	0.09
ALL FIELDS	751	0.7	100.1	38.7	+ 14	0.16
MALES						
Physical Science	105	0.3	8.8	82.0	+ 48	0.06
Engineering	62	0.3	5.2	83.8	+126	0.06
Life Science	127	0.4	10.8	65.8	+ 52	0.08
Social Science	283	0.9	23.8	59.8	- 21	0.18
Humanities	151	0.8	12.7	63.4	- 8	0.16
Education	398	1.3	33.5	53.3	- 26	0.26
Professional	63	0.6	5.3	72.4	+ 7	0.12
ALL FIELDS	1,189	0.7	100.1	61.3	- 4	0.14

Source: Unpublished tabulations from the National Research Council.

[1]Number of Chicana/o doctorates in that field.

[2]Percent of Chicana/o doctorates in that field.

[3]Percent of all Chicana or Chicano doctorates.

[4]Percent Chicano females/males in that field.

[5]Percent change from the 1981-85 period to the 1986-90 period.

[6]The parity index is the percent of Chicana/o PhDs for the 1980-90 period divided by their average percentage of the population age 30-34 from 1980 to 1990 (U.S. Bureau of the Census, 1983, 1992). A parity number of 1.00 means the Chicana/o doctorate production in proportion to their representation in the population. Numbers over 1.00 represent overrepresentation and numbers below 1.00 represent underrepresentation.

California, the California State University system produces the largest number of these future doctorates. Although the largest urban institutions in the CSU, UC, and private systems produce the largest number of these doctorates, some smaller or less urban colleges are supplying more than their size and/or location would have predicted. The role California baccalaureate-granting institutions played in the production of PhDs among Chicano is shown in Table 2.

Chicanas

Of the 751 Chicanas who received doctorates between 1980 and 1990, 199 (27 percent) did their baccalaureate work in California colleges or universities, compared with 29 percent in Texas, 6 percent in New Mexico, 4 percent in Arizona, and 2 percent in Colorado (Solorzano, 1992). Thus, 67 percent of Chicana PhDs did their baccalaureate work in the southwest.

Of the 199 Chicana PhDs who did their undergraduate work in California colleges and universities, 82 (41 percent) attended California State University institutions, 71 (36 percent) attended University of California schools, and 46 (23 percent) attended private institutions. In the CSU system, the top five schools were Los Angeles, Northridge, San Diego, Fresno, and Fullerton. In the UC system, the top five baccalaureate-granting institutions were Berkeley, Los Angeles, Santa Barbara, Irvine, and Santa Cruz. Among the top private colleges and universities were Stanford University, University of Southern California, Occidental College, and the University of Santa Clara.

Chicanos

Of the 1,189 Chicanos who received doctorates between 1980 and 1990, 302 (25 percent) did their baccalaureate work in California colleges and universities, 251 (21 percent) studied in Texas, 67 (6 percent) studied in New Mexico, 48 (4 percent) studied in Arizona, and 47 (4 percent) graduated from Colorado schools. Of the 302 Chicano doctorates who did their undergraduate work in California, 150 (50 percent) went through the CSU system, 118 (39 percent) attended UC schools, and 34 (11 percent) graduated from private colleges.

The CSU colleges that granted the most baccalaureates were Los Angeles, Long Beach, San Diego State, Fresno, and San Jose State. The top five baccalaureate-granting schools in the UC system were Berkeley, Los Angeles, Santa Barbara, San Diego, and Santa Cruz. The top private colleges were Loyola Marymount University, Stanford University, University of Southern California, and St. Mary's College.

Doctorate-granting Institutions

California institutions produce the largest share of Chicano and Chicana doctorates. Although the major UC campuses produce the largest number of doctorates, some smaller UC and private institutions — such as Riverside, Irvine, Davis, Santa Cruz, Claremont Graduate School, University of San Francisco, and U.S. International University — are contributing more than their size and/or location would have predicted.

Chicanas

Overall, of the 751 Chicanas who received doctorates from 1980 to 1990, 202 (27 percent) earned them in California schools (see Table 3). The next-highest producer was Texas with 25

Table 2. California Baccalaureate Institutions of Chicana/o Doctorate Recipients (1980-1990)

FEMALES			MALES
CALIFORNIA STATE UNIVERSITY			
Los Angeles	14	Los Angeles	35
Northridge	13	Long Beach	19
San Diego	12	San Diego	19
Fresno	11	Fresno	18
Fullerton	9	San Jose	15
Long Beach	5	Fullerton	11
California Polytechnic — Pomona	4	Sacramento	8
Sacramento	4	Northridge	7
San Francisco	4	California Polytechnic	6
Chico	3	San Bernardino	6
San Jose	3	San Francisco	6
CSU Total	**82**		**150**
UNIVERSITY OF CALIFORNIA			
Berkeley	14	Berkeley	26
Los Angeles	11	Los Angeles	21
Santa Barbara	11	Santa Barbara	20
Irvine	10	San Diego	14
Santa Cruz	10	Santa Cruz	13
Riverside	8	Riverside	10
Davis	4	Irvine	8
San Diego	3	Davis	6
UC Total	**71**		**118**
PRIVATE COLLEGES AND UNIVERSITIES			
Stanford University	11	Loyola Marymount University	12
California/Defunct Institution	10	Stanford University	9
University of Southern California	8	University of Southern California	8
Occidental College	4	St. Mary's College	5
Santa Clara University	4		
Loyola Marymount University	3		
University of the Pacific	3		
University of San Diego	3		
Private Total	**46**		**34**
Total California Schools	**199**		**302**

Source: Unpublished tabulations from the National Research Council.

Note: These data cover only institutions that produced three or more students who went on to receive a doctorate during 1980 to 1990.

percent, followed by New Mexico (5 percent), Arizona (4 percent), and Colorado (3 percent). A total of 64 percent did their doctorate work in the Southwest.

Of the 202 California Chicana doctorates, 102 (51 percent) received a PhD from the University of California, while 100 (49 percent) graduated from private California universities. The top five UC doctorate-granting campuses were Los Angeles, Berkeley, Riverside, San Diego, and Santa Barbara. The top four private California universities were Stanford, University of Southern California, Claremont Graduate School, and University of San Francisco.

Table 3. California Doctoral Institutions of Chicana/o Doctorate Recipients (1980-1990)

FEMALES			MALES
		UNIVERSITY OF CALIFORNIA	
Los Angeles	31	Los Angeles	48
Berkeley	25	Berkeley	38
Riverside	11	Santa Barbara	24
San Diego	9	Riverside	20
Santa Barbara	9	San Diego	17
Irvine	7	Irvine	14
Davis	5	Davis	13
Santa Crus	5	Santa Cruz	12
UC Total	**102**		**186**
		PRIVATE COLLEGES AND UNIVERSITIES	
Stanford University	11	Stanford University	36
University of Southern California	10	University of Southern California	35
Claremont Graduate School	8	U.S. International University	20
University of San Francisco	4	Claremont Graduate School	13
University of the Pacific	4	University of San Francisco	13
California School of Prof. Psychology (Alhambra)	3	University of the Pacific	10
U.S. International University	3		
California School of Prof. Psychology (San Diego)	3		
Private Total	**100**		**127**
Total California Schools	**202**		**313**

Source: Unpublished tabulations from the National Research Council.

Chicanos

Of the 1,189 Chicanos who earned doctorates, 313 (26 percent) graduated from California schools, 17 percent received degrees from Texas, 5 percent from New Mexico, 4 percent from Colorado, and 3 percent from Arizona. A total of 56 percent earned their doctorates in the Southwest.

During this 11-year period, 186 of the 313 California doctoral recipients (60 percent) studied at the University of California. The top five UC doctorate-granting campuses were Los Angeles, Berkeley, Santa Barbara, Riverside, and San Diego. The 127 (41 percent) who received their doctorates from private California universities graduated from six institutions: Stanford University, University of Southern California, U.S. International University, Claremont Graduate School, University of San Francisco, and University of the Pacific.

CHICANA AND CHICANO FORD FOUNDATION FELLOWS IN CALIFORNIA

To examine the resources, barriers, and critical events in the career paths of Chicana/o doctorates, we studied a group of California scholars who were awarded one of the most prestigious and selective fellowships in the United States: the Ford Foundation Predoctoral and Dissertation Minority Fellowship (1986-1991) and Postdoctoral Minority Fellowship (1980-1991).

From 1980 to 1991, the Ford Foundation awarded 935 predoctoral, dissertation, and postdoctoral fellowships to African American, Chicano, Puerto Rican, Native American, and Pacific Island scholars who were U.S. citizens or permanent residents. The Ford Fellowship is given in the fields of physical science, engineering, life science, social science, and humanities. For this research, only Chicana and Chicano Fellows were examined.

After reviewing previous qualitative and quantitative studies, an instrument was developed to examine the resources, barriers, and critical events these predoctoral, dissertation, and postdoctoral Ford Fellows might experience on the road to the doctorate. The survey was divided into four sections: (1) demographic and background information, (2) high school experiences, (3) undergraduate experiences, and (4) doctoral experiences. Additional questions were included on important undergraduate readings, general advice to Latino undergraduates, and the impact of the Ford Fellowship on the recipients' academic and professional development. The survey, which contained both closed- and open-ended items (i.e., multiple choice and essay questions), was field tested and finalized into a nine-page instrument, with blank pages provided for additional comments (see the Appendix).[5] Respondents were also asked to send their current curriculum vitae.

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[5] Most of the closed-ended questions had three-point response categories: frequently, occasionally, never; very important, important, not important; greatly interfered, somewhat interfered, never interfered; major source, minor source, not a source. For this study, only those who answered with the highest categories — i.e., frequently; very important; greatly interfered; major source — were examined. Similarly, the text focuses on these high-end categories, and specifically where the response was greater than 25 percent.

Demographic and Family Characteristics

For this study, only 22 Chicana and 44 Chicano respondents were examined (see Table 4). The females in the sample were older than the males, with median ages, respectively, of 37.5 and 33.0. Males came from slightly larger households during their high school years. Although the vast majority of the respondents lived in two-parent homes, the percentages were slightly higher for males. Moreover, women were more likely to be either first-born or the sole children in their families. The majority of both males and females were raised in the Catholic faith during their childhood and adolescent years. As the Ford Fellowship is given only to U.S. citizens and permanent residents, the vast majority of respondents were born in the United States. Finally, a much larger percentage of women than men spoke only English during their elementary and secondary years, while more men spoke only Spanish. However, the vast majority of both men and women grew up in bilingual Spanish/English homes.

Parents' Education

The female respondents had both the most- and least-educated mothers (see Table 5), but the males had a higher percentage of fathers who had not completed high school. The percentage of fathers with a bachelor's degree or above was about the same for both males and females. The respondents' parents had more formal education than the Chicano population at large: 57 to 68 percent had a high school diploma or above, compared to only 44 percent of people in the U.S. of Mexican origin in 1990 (U.S. Bureau of the Census, 1991).

Table 4. Demographic and Family Characteristics

	Males (N=44)	Females (N=22)		Males (N=44)	Females (N=22)
Percent	66.7%	33.3%	Nativity:		
Age (Median)	33.0	37.5	Immigrant	9.3	13.6%
Age Range	22–53	22–45	First Generation	23.3	13.6
Household Size (Median)	6.0	5.5	Second Generation	67.4	72.7
Two-Parent Households	88.1%	81.0%			
			Languages Spoken in Home:		
Birth Order			*Elementary Years:*		
Only Child	6.8%	13.6%	English Only	4.7	18.2
Middle Child	47.7	31.8	Bilingual	81.4	63.7
Youngest Child	20.5	18.2	Spanish Only	14.0	18.2
Religious Affiliation			*High School Years:*		
Catholic	88.4%	90.9%	English Only	16.3	27.3
Protestant	2.3	–.–	Bilingual	76.8	68.2
Other	4.7	–.–	Spanish Only	7.0	4.5
No Affiliation	4.7	9.1			

Parents' Occupation

The mothers of both females and males were most frequently homemakers, as shown in Table 5. The females' mothers who worked outside the home were more likely to occupy blue-collar jobs and less likely to be in clerical occupations than the males' mothers. The fathers of both male and female respondents were most frequently in blue-collar occupations.

Table 5. Parents' Education and Occupation

	Males (N=44)	Females (N=22)
Mother's Education:		
Less than High School	36.4%	42.9%
High School Diploma	38.6	33.3
Some Postsecondary Education	13.6	–.–
BA and Above	11.4	23.8
Father's Education:		
Less than High School	40.5	31.8
High School Diploma	19.0	36.4
Some Postsecondary Education	11.9	4.5
BA and Above	28.6	27.3
Mother's Occupation:		
Blue Collar	14.0	27.2
Clerical	14.0	9.1
Professional	14.0	13.5
Homemaker	48.8	45.5
Unemployed	4.7	–.–
Student	2.3	4.5
Deceased	2.3	–.–
Father's Occupation:		
Blue Collar	46.3	50.0
Clerical	4.9	–.–
Professional	29.3	20.0
Sales/Technical	9.7	25.0
Military	2.4	–.–
Unemployed	2.4	–.–
Retired	–.–	5.0
Student	2.4	–.–
Deceased	2.4	–.–

This group of scholars is very different from the general Chicano population and comparisons should be made with caution. For instance, while these Chicana and Chicano scientists had higher social origins (based on parent's education and occupation) than the Chicano population in general, they have much lower social origins than similar samples of non-Chicano academics (see Berger, 1990; Bowen and Rudenstine, 1992; O'Connell and Russo, 1983, 1988; Pearson, 1985; Pearson and Bechtel, 1989; Riley, 1988; Zuckerman, 1977).

High School Years

High School Type and Academic Program

Similarly, the vast majority of both males and females attended public high schools (76.7 percent and 81.8 percent, respectively). Most were in college preparatory programs, but a slightly higher percentage of females apparently were placed in general academic programs (27.3 percent of the women compared to 19 percent of the men).

Experiences with Racial and Gender Discrimination

During their high school years, a much greater percentage of women experienced frequent racial and gender discrimination than men (see Table 6). They also experienced more frequent discrimination from teachers, counselors, administrators, and other students. For instance, as high school students, several of the respondents told of being called, or of hearing people speak of Mexicans as, "wetbacks," "beaners," and "spics." Although they mentioned being treated differently by teachers and counselors based on what they now describe as their race or ethnicity, gender, or working-class background, many of the respondents viewed these barriers as a form of motivation to succeed — to show those who doubted their skills that they were wrong.

Advice from High School Counselors

It also seems there were some gender differences in the type of advice the respondents received from their high school counselors (see Table 7). For instance, a higher percentage of women received frequent advice about going to public and private four-year colleges than did men. However, what seems important about the findings is the overall infrequency of college counseling for such a unique sample of scholars. One would think these respondents would have been counseled more frequently and encouraged to apply to the best colleges in the country than the findings suggest.

In fact, some of the respondents mentioned that high school teachers and counselors discouraged them from considering anything but a community college education. One Chicana described how a high school counselor discouraged her from looking at four-year college catalogs, even though she insisted. The counselor explained that a two-year college was more "realistic" for the daughter of a farmworker. Similarly, another respondent recalled that despite his efforts to get catalogs for four-year colleges, the counselor would always steer him to the local community college, stressing the affordability and transferability of that college. Many of these scholars mentioned lack of adequate college counseling as the single most significant barrier they had to overcome during their high school years.

Encouragement to Pursue Higher Education

Males in the sample apparently received more frequent encouragement than females to pursue higher education from high school teachers of both sexes (see Table 8). Their experiences were similar, however, in that they each seemed to get more frequent encouragement from teachers of their own sex.

Table 6. Frequent Experiences with Discrimination in High School

	Males (N=44)	Females (N=22)
Type of Discrimination		
Race	2.3%	45.5%
Gender	–.–	42.9
Source of Discrimination		
Teachers	–.–	14.3
Counselors	–.–	14.3
Administrators	2.4	19.0
Students	4.9	14.3

Table 7. Frequent Advice from a High School Counselor to Consider Higher Education

	Males (N=44)	Females (N=22)
Advice to Consider:		
Public 4–year Colleges	15.9	22.7
Private 4–year Colleges	9.3	13.6
Elite 4–year Colleges	9.3	9.1

Table 8. Source of Frequent Encouragement in High School to Pursue Higher Education

	Males (N=44)	Females (N=22)
Female Teacher	34.1%	23.8%
Male Teacher	40.9	14.3
Mother	54.5	57.1
Father	48.8	36.4

In addition, both female and male respondents received more frequent encouragement from their mothers and fathers than they did from their teachers. Mothers seemed to give more frequent encouragement to their children than did the fathers. Females seemed to get the most frequent encouragement to pursue higher education from their mothers, followed by their fathers, their female teachers, and lastly their male teachers. Men seemed to get the most frequent encouragement to pursue higher education from their mothers, followed by their fathers, male teachers, and female teachers.

Some of the respondents recalled both Chicano and non-Chicano high school teachers and counselors who had believed in them, listened to them, and pushed them into higher education. Many of the subjects talked about the tremendous support they received from their parents. For working-class parents, this meant sacrificing what little material resources they had for their child's education, as well as providing constant moral support. A Chicana scientist of working-class background recalled that her parents took her to every one of the nine University of California campuses while she was in high school, and she ultimately earned her baccalaureate at one of them.

Table 9 summarizes the resources and barriers that the Ford Fellows mentioned in both the closed- and open-ended survey.

Undergraduate Years

High School to College Transition

Immediately after high school and during their undergraduate years, a large percentage of both the men and the women in the sample went to work part- or full-time. For instance, 36 percent of the men and 41 percent of the women worked part-time. Also, 14 percent of the men and 27 percent of the women indicated that they worked full-time. Further, slightly more than 9 percent of the men served in the military between high school and college, and a slightly higher percent of the men attended community college (45.2 percent of the men compared to 40.9 percent of the women). A sizable number mentioned having to work in order to pay for college expenses. Sometimes it was the hard work of manual and tedious labor that pushed them into college. As one of the respondents said, "work kept me sane. I could either stick it out or pick strawberries! Tough choice." Another said, "when I was in high school I did many manual labor jobs. From this experience, I realized what hard work was and what was the alternative to college, so I had no problem with pursuing academics."

While some saw work as the negative catalyst to continue their education, it was also a positive experience. A couple of respondents recalled that "working made me appreciate education," "work taught me self-discipline," or "work as a high school and college student developed in me a productive work ethic that I still have today."

Choosing a College

Although respondents listed many explanations for choosing a college, over 25 percent of the women in the sample considered very important such reasons as affordable tuition, financial aid package, friends going to college, and parental encouragement (see Table 10). In contrast, the men listed only affordable tuition and the financial aid package as being very important.

Financial assistance often determined where many respondents attended college. Although some were accepted by private colleges and universities, financial considerations limited their

Table 9. Resources and Barriers for Ford Fellows during High School

Males	Females
Resources	
College Counseling	College Counseling
Solid College–Prep Curriculum	Solid College–Prep Curriculum
Teachers (caring and encouragement)	Teachers (caring and encouragement)
Role Models (including Chicanos)	Role Models (including Chicanas and women)
Family Support (material and emotional)	Family Support (material and emotional)
Negative Experiences As Motivator	Negative Experiences As Motivator
Barriers	
Lack of Preparation at High School Level	Lack of Preparation at High School Level
Low Expectations of Teachers:	Low Expectations of Teachers:
As Chicanos	As Chicanas
As Poor	As Poor
	As Women
Lack of Encouragement to Pursue College	Lack of Encouragement to Pursue College

Table 10. Factors Considered Very Important in Choosing a College

	Males (N=44)	Females (N=22)
College Catalogs	7.0%	4.8%
Counselor Advice	4.5	9.1
Teacher Advice	11.9	4.5
College Visit	11.9	13.6
College Recruiter	2.3	22.7
Affordable Tuition	41.9	55.0
Financial Aid Package	35.9	42.9
Parent Encouragement	14.3	27.3
Relative's Encouragement	11.9	18.2
Friends Going to College	18.6	36.4
Parents Wanted Me to Live Near Home	16.3	19.0
I Wanted to Live Near Home	24.4	15.0

feasibility. Many reported that going to a community college was the only financial option they had. Importantly, 45 percent of the men and 41 percent of the women attended a two-year community college. Some mentioned that because of their inadequate counseling, lack of academic preparation, or financial circumstance, attending a community college was the only real alternative they had of obtaining a higher education. Others spoke of their difficulty in making their way through the community college, recalling how this period in their academic career turned out to be a positive benchmark in their educational path. Clearly, for a working-class population, financial assistance determines if students attend college, where they attend, and what options significant others feel are realistically open to them.

Some of the informants talked about their lack of preparation for college while in high school. One individual summed up the feelings of many others when he stated, "the biggest barrier was starting behind most of my peers who had attended academies and high schools with more resources." Another women recounted, "I attended a segregated high school and it did not prepare me academically for college." A third person recalled, "I didn't have the social skills like socializing and networking that my peers had."

Choosing a College Major

The respondents listed several reasons for choosing an undergraduate major. The women in the sample listed as very important the fact that they enjoyed the field, it fulfilled personal expectations, they excelled in coursework, and they could explore ethnic and gender issues (see Table 11). The men's reasons were somewhat different: they enjoyed the field, they excelled in coursework, it fulfilled personal expectations, it prepared them for graduate school, and they could explore ethnic issues.

A high percentage — 48 percent of the women and 50 percent of the men — changed majors at least once during their undergraduate years. Some of the respondents cited weeder or filter courses (i.e., courses that students must take and pass with a certain grade to stay in the major) as a critical factor in their changing academic majors. Others in the social sciences mentioned statistics as either the filter course or the course that prolonged their stay at the university.

Financial Support

Most respondents used such traditional sources of support as scholarships, grants, loans, work, and parental contributions (see Table 12). There were some gender differences, however, in the type of support obtained. Women received fewer scholarships and grants and had to rely more on loans, work, and parental contribution. These gender differences in support may be the result of females having slightly higher social origins. Once again, many of the subjects felt that financial assistance was critical. Others talked about financial responsibilities at home — having to work both to remain in school and help the family.

Experiences with Racial and Gender Discrimination

During their undergraduate years, as in high school, a much larger percentage of women respondents experienced frequent racial and gender discrimination (see Table 13). These women also experienced more frequent discrimination from professors and other students. Many felt that sexism was a constant barrier they experienced at the university. Some talked about not being

Table 11. Most Important Factors in Choosing a College Major

	Males (N=44)	Females (N=22)
Enjoyed the Field	79.5%	81.8%
Excelled in Coursework	59.1	45.5
Job Opportunities After Graduation	18.2	4.8
Preparation for Graduate School	29.5	13.6
Personal Expectations	58.1	63.6
Mother's Expectations	4.5	4.5
Father's Expectations	4.5	—.–
Explore Ethnic Issues	25.0	38.1
Explore Gender Issues	9.1	28.6

Table 12. Major Sources of Undergraduate Financial Support

	Males (N=44)	Females (N=22)
Scholarships	54.5%	47.6%
Grants	51.2	36.8
Loans	38.6	50.0
Work	43.2	57.1
Parental Contribution	40.9	54.5

Table 13. Frequent Experiences with Discrimination in College

	Males (N=44)	Females (N=22)
Type of Discrimination		
Race	16.3%	31.8%
Gender	—.–	54.5
Source of Discrimination		
Professors	2.3	28.6
Counselors	4.5	4.5
Administrators	2.3	9.1
Students	11.4	22.7

listened to and not being taken seriously in and out of class. Still others recall sexist comments, attitudes, and specific behaviors from both their student peers and faculty.

Although the majority were regularly admitted to the university, some of the Ford Fellows spoke of being looked upon by faculty and students as a special-admit or affirmative action student. As one stated, "people viewed me as an affirmative action student, who got there on preferential treatment, and who didn't belong at this college." Many of the respondents used the negative experiences as a catalyst to achieve.

In contrast, many mentioned the positive experience of being involved during their undergraduate years in student political organizations such as UMAS (United Mexican American Students), MAYO (Mexican American Youth Organization), and MEChA (Movimiento Estudiantes Chicanos de Aztlán). Also, many participated in statewide programs whose purpose was to bring more minority students onto campus, such as the High Potential Program, Educational Opportunity Program, Student Affirmative Action Program, and the Academic Advancement Program. Still others participated in mainly federal government programs whose purpose was to increase the number of minority students in specific academic fields, such as MBRS (Minority Biomedical Research and Support Program), MEP (Minority Engineering Program), MARCS (Minority Access to Research Careers and Services Program), and MSRP (Minority Summer Research Program). Some of the subjects revealed that they entered and remained in college mainly because of the academic, financial, social, and emotional support of individuals, organizations, and programs that provided a haven from what they describe as a cold, inhospitable, racist, sexist, and classist undergraduate environment.

Encouragement to Pursue Graduate School

At the undergraduate level, male respondents reportedly got more frequent encouragement to pursue graduate education from male professors than they received from female professors (see Table 14). On the other hand, females reportedly got more encouragement from their female professors than their male professors. Both male and female professors appear to be more supportive of their own sex. Overall, many of the scholars mentioned the lack of information and encouragement to pursue graduate studies as critical barriers in the transition from undergraduate to graduate school.

Table 14. Frequent Encouragement to Pursue Graduate School

	Males (N=44)	**Females** (N=22)
Encouragement from a Female Professor	22.7%	31.8%
Encouragement from a Male Professor	54.5	18.2

Lack of Information

Some respondents talked about the lack of information and communication that filters through faculty and administrators to students at the "educational margins" concerning such issues as financial aid, other school-related resources, and graduate school.

Lack of Role Models

Many respondents mentioned the lack of Chicano and Chicana role models during their undergraduate years. One spoke of being influenced by a Chicana professor who was "the first Chicana PhD I had ever seen and she gave me the idea that I could one day become a professor." She now regrets never having mentioned to the professor the influence the encounter had on her development. Still others spoke of never having or seeing a Chicana or Chicana professor in college and how it might have been important to have some role models there.

Mentoring

Being mentored by a faculty member or graduate student was mentioned as an important experience during undergraduate years. Many women described their undergraduate mentors as providing emotional support: their mentors respected them, listened to them, validated what they thought, believed in them, were supportive, showed confidence in them, and watched out for them. Men, on the other hand, spoke of their relationship with mentors in more instrumental or material terms: as getting them involved in research projects, providing financial assistance as part of these projects, teaching them valuable skills, and encouraging them to continue to graduate school. Respondents also spoke of their relationship with peers as a form of peer mentoring. Those who had skills or information in certain areas would mentor others who were less skilled and informed. Because of the few role models and faculty mentors available, peer mentoring seemed the most consistent and feasible form of support available.

Research Experience

Another important form of support that informants mentioned was their experience in faculty research projects. Although this involvement occurred primarily in the sciences, many subjects mentioned the importance of this experience and the effect it had on their finishing college and going to graduate school. For many of the scholars, involvement in undergraduate hands-on research during the school year and in summers was one the most important experiences in their academic life. This research experience was hard to come by, however, and many students who needed it never received it.

Family Encouragement

Many respondents spoke about their mothers, fathers, sisters, brothers, extended family members, and friends as being critical in their development. As one reported, for example, "knowing that your family is really proud of what you are doing can keep you going during the difficult times." Another spoke of her family giving her the little money they had to pay for books, and her feeling of "not wanting to let them down." The seeds of achievement appear to have been planted in their families of origin. Despite their low socioeconomic origins, these seeds took the form of parental values and behaviors concerning education, such as the constant

encouragement to pursue education, supplying what little material and financial help they could afford, and providing a safe haven from college life.

Table 15 summarizes the undergraduate resources and barriers the Ford Fellows mentioned in both the closed- and open-ended survey.

Graduate Years

Reasons for Going to Graduate School

The respondents' most important reasons for going to graduate school are found in Table 16. More than 25 percent of the men in the sample chose, in rank order, growing intellectually,

Table 15. Undergraduate Resources and Barriers for Ford Fellows

Males	Females
Resources	
Mentoring	Mentoring
Faculty	Faculty
	Peer
Role Models	Role Models
Chicanas/os	Chicanas/os
	Women
Research Experiences	Research Experiences
Campus Organizations	Campus Organizations
Ethnic	Ethnic
Field	Field
	Women
Financial Support	Financial Support
Scholarships	Scholarships
Family Support	Family Support
Negative Experiences As Motivator	Negative Experiences As Motivator
Barriers	
Lack of Financial Support	Lack of Financial Support
Low Expectations of Professors	Low Expectations of Professors
Stigma Attached to Being a Minority Student	Stigma Attached to Being a Minority Student
Isolation	Isolation
Lack of Preparation for Graduate School	Lack of Preparation for Graduate School
Lack of Encouragement to Pursue Graduate School	Lack of Encouragement to Pursue Graduate School
	Gender Discrimination from Professors
	Racial Discrimination from Professors
	Racial Discrimination from Peers

making a contribution to the field, contributing to the advancement of minorities, and occupational mobility. The women's rank-order choices were growing intellectually, making a contribution to the field, contributing to the advancement of minorities, and contributing to the advancement of women. Although both men and women agreed on the importance of the first three, the female scholars clearly see contributing to the advancement of minorities, and especially to women, as being more important. One possible explanation for this divergence is that the male respondents were more likely to be in physical science and engineering fields (see Table 17), where the explicit contributions of minorities and women might not be apparent, and a higher percentage of the women were in the social sciences, life sciences, and humanities, where female contributions are more evident.

Table 16. Most Important Reasons for Going to Graduate School

	Males (N=44)	Females (N=22)
Occupational Mobility	32.6%	13.6%
Social Status	14.3	—.–
Make Money	14.3	—.–
Grow Intellectually	74.4	86.4
Make Contribution to Field	58.1	77.3
Contribute to Advancement of Minorities	44.2	68.2
Contribute to Advancement of Women	4.8	63.6

Doctoral Institutions

Table 18 lists the educational institutions the respondents attended, by gender. Forty-three percent of the men attended or are attending one of the nine University of California schools, with UCLA ranking first (nine Fellows) among the public, while Stanford University led the private institutions (also nine, or 21 percent). Ten of the men sought universities outside California (23 percent), with no campus having more than two current graduate students or graduates. On the other hand, 17 (or 77 percent) of the women are attending or attended University of California doctoral programs, with Berkeley leading (seven students). One woman attended Stanford University, and three (or 14 percent) went to schools outside California.

Doctoral Fields

There are some gender differences in the doctoral fields of these scholars. For instance, no women were found in either the physical sciences or engineering. However, a slightly higher percentage of females were in the life sciences and humanities, while about equal numbers were in the social sciences and selected professional fields.

Table 17. Graduate Degree Fields of Ford Fellows

	Males (44)		Females (22)	
	#	%	#	%
Physical Science	4	10.0	–	–.–
Mathematics	1	2.5	–	–.–
Physics	2	5.0	–	–.–
Computer Science	1	2.5	–	–.–
Engineering	4	10.0	–	–.–
Aero–Astro Engineering	1	2.5	–	–.–
Chemical Engineering	1	2.5	–	–.–
Electrical Engineering	1	2.5	–	–.–
Mechanical Engineering	1	2.5	–	–.–
Life Science	6	15.0	5	24.0
General Biology	1	2.5	1	4.8
Microbiology/Bacteriology	2	5.0	–	–.–
Botany	–	–.–	1	4.8
Marine/Life Science	–	–.–	1	4.8
Other Biological Science	3	7.5	1	4.8
Pharmacology	–	–.–	1	4.8
Social Science	11	27.5	6	28.6
Anthropology	2	5.0	1	4.8
Economics	1	2.5	–	–.–
Psychology	6	15.0	2	9.5
Sociology	1	2.5	3	14.3
Ethnic Studies	1	2.5	–	–.–
Humanities	13	32.5	9	42.8
English	1	2.5	2	9.5
History	9	22.5	4	19.0
Language/Literature	1	2.5	2	9.5
Other Humanities	2	5.0	1	4.8
Professional	2	5.0	1	4.8
Communication	1	2.5	–	–.–
Architecture	–	–.–	1	4.8
Education	1	2.5	–	–.–

Table 18. Doctoral Institutions of Ford Fellows Sampled

Males (N=44)		Females (N=22)	
University of California		*University of California*	
(N=19; 43.2%)		*(N=17; 77.3%)*	
Los Angeles	9	Berkeley	7
Berkeley	4	Los Angeles	5
San Diego	2	San Diego	4
Davis	1	Santa Cruz	1
Irvine	1		
Riverside	1		
Santa Cruz	1		
Private California Universities		*Private California Universities*	
(N=9; 20.5%)		*(N=1; 4.5%)*	
Stanford University	9	Stanford University	1
Universities Outside California		*Universities Outside California*	
(N=10; 22.7%)		*(N=3; 13.6%)*	
University of Texas–Austin	2	Yale University	1
Georgetown University	1	Cornell University	1
University of Houston	1	University of Houston	1
Harvard University	1		
Princeton University	1		
University of Michigan	1		
University of Kansas	1		
University of New Mexico	1		
Massachusetts Institute of Technology	1		

Major Sources of Financial Support

The major sources of the respondents' financial support while in graduate school are cited in Table 19. During the coursework stage men received more scholarships, while the women received slightly more grants, loans, and work income. At the dissertation stage, men were more likely to receive grants and spousal support, while women received more scholarships and work income.

Most of the respondents mentioned the importance of financial assistance during their doctoral studies. Many of these scholars made it clear that the financial award of the Ford Fellowship was critical in their continuing in the doctoral program at a satisfactory pace. A few even suggested that without it they would have left after receiving their master's degree or would have left graduate school altogether.

Table 19. Major Sources of Financial Support in Graduate School

	Males (N=44)	Females (N=22)
Coursework Stage		
Scholarships	85.0%	68.2%
Grants	40.5	47.4
Loans	11.1	15.0
Work	37.8	55.0
Parental Contribution	2.7	5.0
Spouse/Partner	17.1	14.3
Dissertation Stage		
Scholarships	80.0	86.7
Grants	56.7	40.0
Loans	14.3	13.3
Work	35.5	62.5
Parental Contribution	3.6	–.–
Spouse/Partner	23.3	13.3

Work in Graduate School

During their coursework stage, as shown in Table 20, both men and women were most likely to be teaching assistants, research assistants, and working off-campus. However, compared to men, women were less likely to have research assistantships and more likely to have teaching assistantships. During the dissertation stage, there was very little difference in the type of work they both engaged in. During graduate studies, however, only one-third to about one-half of both men and women were engaged in what many feel is the most critical of experiences in graduate school: research assistantships. Although many mentioned the positive effect of working on faculty research as graduate students, and some continue to correspond and collaborate with professors who introduced them to research, others claimed there were few opportunities for research assistantships and that minority and women students were less likely to receive these prized assignments.

Experience with Racial and Gender Discrimination

As in high school and undergraduate years, a much larger percentage of women frequently experienced both racial and gender discrimination from professors, administrators, staff, and other students than did the men (see Table 21). For instance, many women expressed deep concern about overt and covert forms of sexism. They talked about being tracked into certain subfields of a discipline that dealt with women's issues, such as family sociology, counseling psychology, and botany. Others felt that their ideas and work were not taken seriously and that their being in graduate school was seen, as one scholar states, "as a lark." Still others talked about being denied the travel grants for conferences and field research that men in their departments routinely

received. Other women mentioned unwanted touching, body language, comments, and jokes as forms of sexism they experienced in graduate school. One woman suggested that "it wasn't that there was more gender discrimination in graduate school than in earlier parts of the educational pipeline, but that my perception has sharpened." In fact, one might argue that women's experience with gender discrimination throughout their life histories have sharpened their perception of racial discrimination and might explain the differences with men on these items.

One scholar recalled that graduate school was the first place he had ever experienced overt racism. He said he "just didn't remember any examples of racism in [his] high school or college years," which he had attributed to being in a predominantly minority high school and college. At

Table 20. Type of Work During Doctoral Studies

	Males (N=44)	Females (N=22)
Coursework Stage		
Research Assistant	45.5%	36.4%
Teaching Assistant	65.9	72.7
Administrative Assistant	4.5	13.6
Off–campus Employment	20.5	13.6
Dissertation Stage		
Research Assistant	34.1	31.8
Teaching Assistant	27.3	31.8
Administrative Assistant	2.3	9.1
Off–campus Employment	25.0	18.2

Table 21. Frequent Experiences with Discrimination in Graduate School

	Males (N=44)	Females (N=22)
Type of Discrimination		
Race	14.3%	45.5%
Gender	—.–	36.4
Source of Discrimination		
Professors	7.1	31.8
Administrators	—.–	13.6
Staff	—.–	4.8
Students	4.8	18.2

the time, he thought differences in treatment were related to differing skill levels of minority students. In reflecting on race and gender discrimination experiences in graduate school, some women talked of "feeling out of place," "not feeling a part of the program," or "falling between the cracks." Some men spoke of "not fitting in my laboratory," "sensing the low expectations of my professors," or "subtle and not-so-subtle racial comments in and out of class." Many of the scholars responded to these experiences by working twice as hard as their graduate peers or by getting deeply involved in their own research and trying to ignore what was happening around them. One person mentioned having to "run faster and work twice as hard to prove I was capable as other doctoral students." Another said, "I just went into a research shell . . . I didn't want to get involved with racial or racist politics in my department." Others talked of forming study groups or academic and social networks with other minority graduate students at both their campus and professional associations. Many of them, for example, mentioned the Annual Ford Fellows Conference as a place where minority scholars receive support and encouragement for their work. Still others talked about being the only Chicana or Chicano in the department and the loneliness of fighting the ethnic and gender battles on their own.

Important Factors in Obtaining a Doctorate

When asked what they perceived to be the most important factors in obtaining a doctoral degree, more than 25 percent of both the women and men cited university, nonuniversity, and summer financial support, faculty advice on research and topics, and encouragement from spouse (see Table 22). Each of these factors, except nonuniversity support, were deemed very important by more men than women.

Table 22. Very Important Factors in Obtaining a Doctoral Degree

	Males (N=44)	Females (N=22)
Financial Support: University	59.5%	40.0%
Financial Support: Nonuniversity	61.9	63.2
Summer Financial Support	38.1	26.3
Faculty Advice: Research	59.5	42.1
Faculty Advice: Topic	45.2	36.8
Spousal Encouragement	46.3	36.8

When these scholars referred to the positive aspects of their doctoral experience they began by describing a mentor, who took an active interest in their work. Respondents gave such examples as "my mentor took me seriously," or "he validated my ideas," or "she boosted my confidence." Some described this person as "one who simply cared about me and my work," or who helped them get additional funding or research or teaching assistantships. They also describe the mentor as the person who "introduced me to more senior scholars in my field."

Many described a nonhierarchical, peer mentoring relationship with other graduate students — particularly with other women and minority students — as the only mentoring they experienced in graduate school. This was seen as a viable option because so few faculty were

accessible to the graduate students surveyed. These student mentors had taken a particular class or had some expertise in a particular area and passed the information on to other students. As students moved up the graduate pipeline, they in turn would mentor less-experienced students. Clearly, these respondents viewed peer mentoring as a more egalitarian, less hierarchical, and positive experience.

In addition, some expressed a deep appreciation for scholars (both historical and contemporary) who entered the academy before them and made their educational road easier to navigate, as well as specific individuals, books, and events that had a profound effect on their personal and academic life. The individuals included famous people as well as not-so-famous minority and other scholars who opened the doors to their laboratories and research projects and gave them hope that they could be practicing researchers. Respondents spoke of the debt they owe to these people who preceded them into their field.

One would think that these scholars might have been positively affected by sponsoring networks of faculty, and mainstream professional and student organizations, as they made their way through educational institutions. Although there were some examples of traditional support, their collective experience does not seem to confirm this position. As stated earlier, they had to either participate in academic and social peer networks or become the "lone wolf." These scholars seem to have made it more on what they know than on who they know. In fact, many described having to work harder at each level of the pipeline than nonminority students.

Factors that Interfered with Graduate Work

Women and men responded differently when asked about factors that interfered with their graduate work, with women noting greater interference than men in almost every category (see Table 23). Twenty percent of the men or more cited burnout as the only greatly interfering factor, while women cited burnout, personal problems, and lack of support from their dissertation chair. A number of both female and male Fellows mentioned their advisor, other faculty, or their

Table 23. Factors That Greatly Interfered with Graduate Work

	Males (N=44)	Females (N=22)
Lack of Support from Dissertation Chair	14.6%	20.0%
Difficulty Selecting Dissertation Topic	9.8	19.0
Dissatisfied with Program	2.5	19.0
Employed Outside of Program	4.9	15.0
Lack of Summer Financial Support	–.–	19.0
Lack of Funds for Dissertation Research	4.9	15.0
Burnout	22.5	35.0
Personal Problems	10.0	25.0
Obligations to Children/Childbirth	5.0	15.0
Needed a Leave of Absence	15.0	10.0

department's "refusal to recognize the legitimacy of gender and ethnic research" as a major barrier they had to overcome in their graduate years. They talked of faculty having "no interest" in or an "indifference" to their work. They also spoke of their department "privileging Euro-American topics and devaluing ethnic or gender topics." Moreover, they said some of their faculty felt that gender and ethnic topics were "too ideological," "too ethnic," "too narrow in focus," or "not objective research." On the other hand, the Ford Fellowship built up their self-confidence and credibility both inside and outside their departments, and many respondents felt that their departments began to view them differently as a result of being awarded the Ford Fellowship.

Tables 24 and 25 summarize the graduate resources and barriers that the Ford Fellows mentioned in both the closed- and open-ended parts of the survey.

POLICY RECOMMENDATIONS

The following policy recommendations start from three basic premises:

1. One goal of social policy is to help the less fortunate and less powerful to achieve equity in society.

2. In a society that values truth and its pursuit, the inclusion of students and faculty with new ideas will not only benefit the Chicana and Chicano community, but will help in the expansion of knowledge and ultimately in California's economic and social development.

3. As meaningful interaction between people tends to break down interethnic and intergender stereotypes, positive interaction between faculty and Chicana and Chicano students at each stage in the educational pipeline is critical.

Implementation of the following recommendations would address the most significant resources and barriers that the Ford scholars voiced in the course of this study.

Recommendations for State Goals and Policy

- The state of California must recommit itself to increased high school graduation rates for Chicana and Chicano students.
- The state of California must recommit itself to recruiting, admitting, retaining, and graduating Chicana and Chicano students at all levels of higher education.
- The state of California must recommit itself to recruiting, retaining, and promoting Chicana and Chicano faculty in all segments of higher education.

Recommendations for High School, College, and Graduate School Programs

High School

- In order to increase the number of high school students who continue on to college, the state should establish a Chicana and Chicano High School Research Assistant Program to get students interested in academic research as a possible career.

  As an incentive for their participation, high school faculty could be given pay differentials

Table 24. Resources for Ford Fellows During Graduate School

Males	Females
Mentoring	Mentoring
Faculty	Faculty
	Peer
Faculty Advice	Faculty Advice
Research	Research
Thesis Topic	Thesis Topic
Role Models	Role Models
Pioneers Before Them	Pioneers Before Them
	Themselves As Role Models for Others
Networks	Networks
Academic Networks	Academic Networks
	Social Networks
Financial Support	Financial Support
Fellowships	Fellowships
Scholarships	Scholarships
Research Assistantships	Research Assistantships
Family Support	Family Support
	Instrumental Support
	Emotional Support
Contribution to the Field	Contribution to the Field
Contribution to Minorities	Contribution to Minorities
	Contribution to Women
Encouragement from Spouse	Encouragement from Spouse
Using Negative Experiences to Motivate	Using Negative Experiences to Motivate
Other Coping Mechanisms	Other Coping Mechanisms
Persistence	Persistence
Determination	Determination
Hard Work	Hard Work
Flexibility	Flexibility
Resourcefulness	Resourcefulness
	Resistance

or stipends, class release time, and undergraduate or graduate student assistance. Moreover, high school students could be given a stipend, after-school and summer employment, and class credit.

- Make sure teachers and counselors are sensitive to strengths of Chicana and Chicano students and encourage them to consider college training for professional careers.
- Work with local colleges, community organizations, and businesses to expose students to college, professional careers, and role models. To that end, high school, community

Table 25. Barriers to Ford Fellows During Graduate School

Males	Females
Lack of Preparation at Undergraduate Level	Lack of Preparation at Undergraduate Level
Lack of Financial Support	Lack of Financial Support
Low Expectations of Professors	Low Expectations of Professors
Stigma As a Minority Student	Stigma As a Minority Student
Isolation	Isolation
Burnout	Burnout
	Gender Discrimination Discrimination from Professors
	Racial Discrimination Discrimination from Professors
	Lack of Support From Thesis Chair Choosing Thesis Topic
	Personal Problems Spousal Relations Childrearing

organizations, university, and business partnerships can be established to form after-school, Saturday, and summer research programs.

- Work with university outreach programs to provide college visitation trips throughout California.

Undergraduate College and University

- In order to increase the number of undergraduate students who continue on to graduate school, the state should establish a Chicana and Chicano Undergraduate Research Assistant Program at all three tiers of the California postsecondary education system.

  As few students enter college with the goal of becoming college professors, faculty who teach undergraduate students are critical in producing the next generation of PhDs. Although research is not the primary function of the community colleges, programs at this level are especially important because this is where the vast majority of Chicana and Chicano students begin their college career. As an incentive for their participation, faculty could be given course release time, seed money for research, reduced overhead costs for extramural grants, or graduate assistants. Students could be given a wage, stipend, fee waiver, course credit, or have their program participation acknowledged in the college transcript.

- Provide adequate financial aid assistance in scholarships, grants, loans, and work-study for Chicana and Chicano undergraduate students.

- It is important to nurture the development of student academic and social support networks both on and off campus. These could be social, political, and discipline-specific clubs.
- Develop a human relations program that helps dispel the myths and stereotypes of Chicana and Chicano students and their communities. In the short term, this can take the form of an ethnic and gender studies requirement for all students who graduate from the university. However, in the long term, schools and departments must integrate their faculties and curricula with Chicana and Chicano professors, courses, content, and research.

Graduate School

- The state should establish a Chicana and Chicano Graduate Research Assistantship Program in each of the UC campuses to give more students the opportunity to conduct research and develop relationships with mentors.

  As an incentive for departments and faculty, a formula might be devised that attaches increased funds for fellowships and graduate assistants to the number of Chicana and Chicano students recruited to and graduated from each department. Also, intramural research grants could be awarded to faculty who have concrete plans to employ Chicana and Chicano students on their projects. Moreover, university overhead charges on extramural grants could be reduced for faculty with explicit plans to include these students.
- Supply students with adequate financial assistance, opportunities to present research at colloquia, opportunities to attend academic conferences, opportunities to form study and dissertation support groups, and support for the establishment of Chicana and Chicano graduate student organizations during the course-work and dissertation writing stages.
- Provide an academic and social climate in which research related to race, ethnicity, and gender is encouraged and supported. To that end, if applicable, schools must support minority and gender group research.
- Sensitize the faculty to Chicana and Chicano student issues. Affirmative efforts must be taken to destroy the myths and stereotypes about minority students and faculty.

We do not know what potential new knowledge has not been developed because of the exclusion of Chicanas and Chicanos from California's higher education system, but may begin to understand the scope of our loss once we make a genuine commitment to breaking down barriers, abolishing policies of exclusion, and building on the strengths of Chicana and Chicano students. This study and the related policy recommendations begin to address that process.

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APPENDIX

Survey Instrument

EDUCATIONAL PATHS OF CHICANO/LATINO DOCTORATES IN THE SCIENCES AND HUMANITIES

As you know, there is a critical shortage of Chicano/Latino students in the doctoral pipeline. Under a grant from the California Policy Seminar, I am examining opportunities, obstacles, and critical events that individuals may encounter in their pursuit of the doctorate. Your participation in this study will help identify educational issues that affect Chicano/Latino access and persistence in doctoral programs. Be assured that your responses will be held in the strictest professional confidence. Thank you in advance for your assistance.

Daniel G. Solorzano
UCLA Graduate School of Education

DEMOGRAPHIC AND BACKGROUND INFORMATION

1. Are you: Female....② Male....①

2. What is your age: _____

3. Circle the highest level of education completed by your parents. (If not natural parents, please answer in terms of foster parents or guardians throughout the survey.)

	Mother	Father
No Formal Education	①	①
Elementary Education	②	②
High School Diploma	③	③
Technical Education	④	④
Some College	⑤	⑤
AA Degree	⑥	⑥
Bachelor's Degree	⑦	⑦
Master's Degree	⑧	⑧
Professional Degree	⑨	⑨
Doctoral Degree	⑩	⑩

4. Please list your parents' occupation during the following periods:

Your elementary years: Mother _____
Father _____

Your high school years: Mother _____
Father _____

Your undergraduate years: Mother _____
Father _____

5. Where were each of the following born? *(Please indicate state and country.)*

You _____

Your mother _____

Your father _____

6. Including yourself, how many people resided in your household during your high school years? _____

Who did you live with during your high school years? *(Circle one for each.)*

Mother.....Y....N
Father.....Y....N
Sibling(s).....Y....N
Relative(s).....Y....N
Other.....Y....N

7. To establish a birth order, please list you and your siblings from oldest to youngest.

Name *(optional)*	Gender	Year of birth	Highest Educ. Attained
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____
_____	F / M	_____	_____

8. What was your religious affiliation during childhood and adolescence?

① Roman Catholic
② Protestant (specify) _____
③ Other (specify) _____
④ No Church Affiliation

9. Ethnically, what term would you use to identify yourself during the following periods?

High school years: _____

Undergraduate years: _____

Doctoral years: _____

Now: _____

10. What is your ethnic origin?

① Mexican
② Chicano/Mexican American
③ Puerto Rican
④ Other Latino (specify) _____
⑤ Other non-Latino (specify) _____

11. What language was spoken in your family's household during the following periods? *(Please mark one for each.)*

	Spanish Only	Spanish/ Some English	English/ Some Spanish	English Only
Elementary years	④	③	②	①
High school years	④	③	②	①
Undergraduate years	④	③	②	①

HIGH SCHOOL YEARS

1. What type of high school did you graduate from?

① Public
② Private (denominational)
③ Private (non-denominational)
④ Other: Please specify _____

Please continue on with Question 2 ➶

2. Please indicate the primary academic program you participated in during high school.

① Vocational program
② General program
③ College preparatory program
④ Other: Please specify _____

3. How often during your high school years did you experience the following?

	Frequently	Occasionally	Never	Not Applicable
Discrimination because of my:				
Race/ethnicity	④	③	②	①
Gender	④	③	②	①
Religion	④	③	②	①
Age	④	③	②	①
Disability	④	③	②	①
Language/accent	④	③	②	①
Discrimination from				
Teachers	④	③	②	①
Counselors	④	③	②	①
Administrators	④	③	②	①
Students	④	③	②	①

4. How often during your high school years did you receive the following?

	Frequently	Occasionally	Never	Not Applicable
Advice from a counselor about:				
Military Service	④	③	②	①
Vocational Training	④	③	②	①
Community College	④	③	②	①
Public 4-yr. College	④	③	②	①
Private 4-yr. College	④	③	②	①
Elite Private 4-yr. College	④	③	②	①
Encouragement from a female teacher to pursue:				
Higher education	④	③	②	①
A professional career	④	③	②	①
Encouragement from a male teacher to pursue:				
Higher education	④	③	②	①
A professional career	④	③	②	①
Encouragement from my mother to pursue:				
Higher education	④	③	②	①
A professional career	④	③	②	①
Encouragement from my father to pursue:				
Higher education	④	③	②	①
A professional career	④	③	②	①

5. During your high school years indicate the level of education <u>expected</u> of you by the following people.

	High School Diploma	Bachelor's Degree	Master's Degree	Professional Degree	Doctoral Degree
Your mother	①	②	③	④	⑤
Your father	①	②	③	④	⑤
Your self	①	②	③	④	⑤

6. During your high school years, indicate the number of individuals you knew who had a baccalaureate degree on the line provided.

___ Immediate family members
___ Extended family members
___ Family friends/neighbors
___ Peers
___ Other: Please specify _____

Please continue on next page

UNDERGRADUATE YEARS

1. What did you do immediately after high school? *(Mark all that apply.)*

___ Attended college part-time
___ Attended college full-time
___ Enlisted in military service
___ Got married
___ Worked part-time
___ Worked full-time
___ Traveled
___ Other: Please specify _____

Did you ever attend a community college? Yes _____ No _____
At what institution did you receive your baccalaureate degree? _____
What year did you begin college? _____
What year did you receive your baccalaureate degree? _____

2. How important were each of the following in choosing an undergraduate college?

	Very Important	Important	Not Important	Not Applicable
High school counselor advised me	④	③	②	①
High school teacher advised me	④	③	②	①
College rating books	④	③	②	①
College catalogues	④	③	②	①
Visited college campus	④	③	②	①
College recruiter visited my high school	④	③	②	①
Participated in college outreach program	④	③	②	①
Parents encouraged me	④	③	②	①
Other relatives encouraged me	④	③	②	①
Friends were going to college	④	③	②	①
I wanted to live near home	④	③	②	①
Parents wanted me to live near home	④	③	②	①
Affordable tuition	④	③	②	①
Better financial aid package	④	③	②	①
Other: Please specify _____	④	③	②	①

3. What was your undergraduate major? _____
Did you change majors during your undergraduate years? Yes ___ No ___
If yes, from what major(s) did you change? _____

4. Mark the importance of the following factors in your selection of a college major.

	Very Important	Important	Not Important	Not Applicable
Enjoyed the discipline	④	③	②	①
Excelled in course work related to major	④	③	②	①
Provided job opportunities upon graduation	④	③	②	①
Prepared me for graduate/professional school	④	③	②	①
Possibility for interdisciplinary studies	④	③	②	①
Provided opportunity to explore ethnic issues	④	③	②	①
Provided opportunity to explore gender issues	④	③	②	①
Fulfilled mother's expectations	④	③	②	①
Fulfilled father's expectations	④	③	②	①
Fulfilled personal expectations	④	③	②	①
Allowed me to separate academic interests from issues of ethnicity	④	③	②	①
Allowed me to separate academic interests from issues of gender	④	③	②	①
Other: Please specify _____	④	③	②	①

5. What were your major and minor sources of financial support as an undergraduate? *(Mark all that apply.)*

	Major Source	Minor Source	Not A Source
Scholarship	③	②	①
Grants	③	②	①
Loans	③	②	①
Work	③	②	①
Parental contribution	③	②	①
Spouse/partner	③	②	①
Other: Please specify _____	③	②	①

If additional space is needed for any open ended questions, please use the last two blank pages of the survey.

6. During your undergraduate years, how did your work experience impact your academic development?

7. Briefly describe the extracurricular activities that had the greatest impact on your academic development.

8. How often during your undergraduate years did you experience the following?

	Frequently	Occasionally	Never	Not Applicable
Discrimination because of my:				
Race/ethnicity	④	③	②	①
Gender	④	③	②	①
Religion	④	③	②	①
Age	④	③	②	①
Disability	④	③	②	①
Language/accent	④	③	②	①
Discrimination from				
Professors	④	③	②	①
Counselors	④	③	②	①
Administrators	④	③	②	①
Students	④	③	②	①

9. During your undergraduate years, did you experience any form of gender discrimination or preferential treatment? Briefly explain.

10. During your undergraduate years, did you experience any form of sexual harassment? Briefly explain.

11. How often during your undergraduate years did you receive the following?

	Frequently	Occasionally	Never	Not Applicable
Encouragement from a female professor to pursue:				
Graduate education	④	③	②	①
A professional career	④	③	②	①
Encouragement from a male professor to pursue:				
Graduate education	④	③	②	①
A professional career	④	③	②	①
Encouragement from my mother to pursue:				
Graduate education	④	③	②	①
A professional career	④	③	②	①
Encouragement from my father to pursue:				
Graduate education	④	③	②	①
A professional career	④	③	②	①

12. During your undergraduate years, indicate the highest level of education expected of you by the following people.

	High School Diploma	Bachelor's Degree	Master's Degree	Professional Degree	Doctoral Degree
Your mother	①	②	③	④	⑤
Your father	①	②	③	④	⑤
Your self	①	②	③	④	⑤

13. In your last year as an undergraduate, what were your career goals? Please specify.

14. Indicate the importance of the following factors in your selection of a career. *(Mark your response.)*

	Very Important	Important	Not Important	Not Applicable
Provided job security	④	③	②	①
Social status	④	③	②	①
Provided desired salary	④	③	②	①
Enabled me to work autonomously	④	③	②	①
Enjoyed the work environment	④	③	②	①
Provided opportunity to explore ethnic issues	④	③	②	①
Provided opportunity to explore gender issues	④	③	②	①
Fulfilled mother's expectations	④	③	②	①
Fulfilled father's expectations	④	③	②	①
Fulfilled personal expectations	④	③	②	①
Allowed me to separate career interests from issues of ethnicity	④	③	②	①
Allowed me to separate career interests from issues of gender	④	③	②	①
Other: Please specify _____	④	③	②	①

15. Were there any individuals in your undergraduate career who took an interest in your academic development? Please describe the relationship.

16. Please describe the resources and/or opportunities that affected your undergraduate academic development.

17. Please describe the barriers and/or obstacles that affected your undergraduate academic development. Explain how you responded to these situations.

DOCTORAL YEARS

1. What did you do immediately after your undergraduate years? *(Mark all that apply.)*

___ Attended college part-time	___ Worked part-time
___ Attended college full-time	___ Worked full-time
___ Enlisted in military service	___ Traveled
___ Got married	___ Other: Please specify _____

What is or was the name of your doctoral institution? _____
What year did you begin your doctoral program? _____ What year did or will you receive your doctorate? _____
In what field did or will you receive your doctorate? _____

2. Upon entering your doctoral program, how many years did you expect it would take to complete your degree? _____

3. When did you first consider attending graduate school?

As a child, I knew I would go to graduate school. ①
As a teenager, I knew I would go to graduate school. ②
As an undergraduate, I knew I would go to graduate school. ③
After receiving my bachelor's degree, I knew I would go to graduate school. ④

4. How important were each of the following reasons when deciding to go to graduate school? *(Mark your response.)*

	Very Important	Important	Not Important	Not Applicable
Improve occupational mobility	④	③	②	①
Enhance social status	④	③	②	①
Make more money	④	③	②	①
Grow intellectually	④	③	②	①
Make a contribution to my field	④	③	②	①
Contribute to the advancement of minorities in the U.S.	④	③	②	①
Contribute to the advancement of women	④	③	②	①
Other: Please specify _____	④	③	②	①

5. Mark the importance of the following factors in your selection of a doctoral field.

	Very Important	Important	Not Important	Not Applicable
Availability of scholarships	④	③	②	①
Enjoyed the discipline	④	③	②	①
Excelled in course work related to field	④	③	②	①
Provided job opportunities upon graduation	④	③	②	①
Prepared me for professional career	④	③	②	①
Provided opportunity to explore ethnic issues	④	③	②	①
Provided opportunity to explore gender issues	④	③	②	①
Fulfilled personal expectations	④	③	②	①
Allowed me to separate academic interests from issues of ethnicity	④	③	②	①
Allowed me to separate academic interests from issues of gender	④	③	②	①
Other: Please specify _____	④	③	②	①

6. What were your major and minor sources of financial support during the following stages? *(Mark all that apply.)*

Course-work stage	Major Source	Minor Source	Not A Source
Scholarship	③	②	①
Grants	③	②	①
Loans	③	②	①
Work	③	②	①
Parental contribution	③	②	①
Spouse/partner	③	②	①
Other: Please specify _____	③	②	①

Dissertation stage	Major Source	Minor Source	Not A Source
Scholarship	③	②	①
Grants	③	②	①
Loans	③	②	①
Work	③	②	①
Parental contribution	③	②	①
Spouse/partner	③	②	①
Other: Please specify _____	③	②	①

Please continue on the next page

7. Please indicate the type of work you did during the following stages. *(Mark all that apply.)*

	On-Campus Employment			
	Research Assistant	Teaching Assistant	Administrative Assistant	Off-Campus Employment
Course-work stage	①	②	③	④
Dissertation stage	①	②	③	④

8. During your graduate years, how did your work experiences affect your academic development?

9. How often during your doctoral years did you experience the following?

	Frequently	Occasionally	Never	Not Applicable
Discrimination because of my:				
Race/ethnicity	④	③	②	①
Gender	④	③	②	①
Religion	④	③	②	①
Age	④	③	②	①
Disability	④	③	②	①
Language/accent	④	③	②	①
Discrimination from				
Professors	④	③	②	①
Administrators	④	③	②	①
Staff	④	③	②	①
Students	④	③	②	①

10. During your doctoral years, did you experience any form of gender discrimination or preferential treatment? Briefly explain.

11. During your doctoral years, did you experience any form of sexual harassment? Briefly explain.

12. Were there any individuals in your doctoral career who took an interest in your academic development? Please describe the relationship.

13. How important were the following factors in obtaining your doctoral degree?

	Very Important	Important	Not Important	Not Applicable
Financial support: university	④	③	②	①
Financial support: non-university	④	③	②	①
Summer financial support	④	③	②	①
Faculty advice on dissertation research process	④	③	②	①
Faculty advice on dissertation topic	④	③	②	①
Encouragement from spouse/partner	④	③	②	①
Other: Please specify _____	④	③	②	①

14. Please mark the factors that interfered with your graduate work.

	Greatly Interfered	Somewhat Interfered	Never Interfered	Not Applicable
Dissertation chair left the university	④	③	②	①
Lack of support from dissertation chair	④	③	②	①
Difficulty selecting dissertation topic	④	③	②	①
Dissatisfied with program	④	③	②	①
Employment outside doctoral program	④	③	②	①
Lack of summer financial support	④	③	②	①
Lack of funds for dissertation research	④	③	②	①
Burn-out	④	③	②	①
Personal problems outside of studies	④	③	②	①
Health problems	④	③	②	①
Obligations to children/childbirth	④	③	②	①
Needed a leave of absence	④	③	②	①
Other: Please specify _____	④	③	②	①

15. Please describe the resources and/or opportunities that affected your graduate academic development.

16. Please describe the barriers and/or obstacles that affected your graduate academic development. Explain how you responded to the situations.

17. During your educational career, list three role models in the order of importance to you (e.g. professor, relative, friend, fictional character, media character/celebrity). Briefly explain the reasons you admired them.

1.

2.

3.

18. If you were to develop a reading list for undergraduate Chicano/Latino students what books would you select? Please rank the books in the order of importance and explain why you chose them.

1.

2.

3.

19. What advice would you give to an undergraduate Chicano/Latino student in pursuit of a doctoral degree in your field?

Please continue on the next page

DOCTORAL YEARS *(Continued)*

20. Please indicate each appointment accepted after receiving your doctoral degree.

	Organization	Academic Rank/Position	Beginning Date	Ending Date
1.				
2.				
3.				

21. How has the Ford Fellowship affected your academic and professional development? Briefly explain.

22. Please remember to include your curriculum vitae in the enclosed return envelope.

23. If you would like a copy of this study's Executive Summary, please indicate your mailing address below.

First _____ Last _____

Street Address _____

City _____ State _____ Zip Code _____

( ) _____

Area Code Telephone

THANK YOU FOR YOUR TIME AND CONSIDERATION.

Please return the completed survey in the postage-paid return envelope to:

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CPS brief

Vol. 5, No. 16 December 1993

A Publication of the California Policy Seminar

THE CALIFORNIA POLICY SEMINAR IS A JOINT PROGRAM OF THE UNIVERSITY OF CALIFORNIA AND STATE GOVERNMENT

The Road to the Doctorate for California's Chicanas and Chicanos: A Study of Ford Foundation Minority Fellows

Daniel G. Solorzano

By any standard used, Chicanas[1] and Chicanos are underrepresented in the faculties of U.S. universities. For years, scholars and policymakers have been commenting on the dismal future of minority faculty production. In fact, the next 10 years will provide an opportunity to increase minority appointments, as a large number of college faculty will be retiring. Although the key that opens one of the first doors to these faculty positions is the doctoral degree, little is known about Chicana and Chicano doctorate production generally and even less is known about production in the 1980s — when the faculties of the 1990s and the beginning of the 21st century were trained.

Other than a few seminal studies, there is little information on the resources, barriers, and critical events these Chicana and Chicano scholars meet on their road to the doctorate. Some recent research has identified factors that have affected the career paths of male and female Nobel prize recipients in science, of sociologists, of women psychologists, and of academics from the working class, but no research has focused primarily on minority, Latino, or Chicano scholars and only one study had a single Chicana case. Also, in recent years, some attention has centered on the graduate school experience of underrepresented minority groups. While a primary concern has been the declining enrollment of African Americans in graduate school (particularly males), little is known about Chicana and Chicano recruitment, admission, retention, and graduation at the doctoral level. A few studies have shown that Latinos are underrepresented in graduate school, but they provide no information by specific Latino subgroup.

This study is an attempt to remedy this oversight by meeting three objectives: 1) provide a national overview of Chicana and Chicano doctorate production in U.S.

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[1] Latino is used as an umbrella term that includes all groups of Latin American-origin in the western hemisphere who are living in the United States as either U.S. citizens or permanent residents. Chicanas and Chicanos are defined as females and males of Mexican origin living in the United States as either U.S. citizens or permanent residents.

universities from 1980 to 1990; 2) explore California's role in producing these doctoral scholars by examining their baccalaureate origins and doctorate-granting institutions; 3) investigate a small sample of Chicana and Chicano doctoral students and postdoctoral scholars to explore the resources, barriers, and critical events they experienced on their road to the doctorate.

Chicana/o Doctorate Production in U.S. Universities

To meet the first objective, a national overview of Chicana and Chicano doctorate production in U.S. universities from 1980 to 1990 was developed using data from the Doctorate Records Project of the National Research Council (NRC). In the 11-year period from 1980 to 1990 a total of 91,837 women received doctorates from U.S. universities, and of those 751 (0.7 percent) were Chicanas. Of the 148,352 men who received doctorates during the period, 1,189 (also 0.7 percent) were Chicanos. For comparative purposes, during this period Chicanas were 4.5 percent of the age 30–34 U.S. cohort and Chicanos were 5.0 percent.

Five additional patterns of Chicana and Chicano doctorate production are represented in the data:

- Both Chicano males and females are severely underrepresented in each of the broad fields of physical science, engineering, life science, social science, humanities, education, and selected professional fields.
- Although both males and females are concentrated in the fields of education, social sciences, and the humanities, males appear to be more widely dispersed throughout the six fields and professional schools than females.
- Chicanas are particularly underrepresented in each of these areas.
- During 1986-1990 the percentage of Chicanas receiving doctorates was higher (+14 percent) than it was during 1981-1985, while the percentage for Chicanos declined slightly (-4 percent). In contrast, the 30-34 Chicana age cohort grew by 76 percent from 1980 to 1990, while the Chicano cohort increased 92 percent. It should be noted, however, that these slight gains for women were relative to a very small base.
- Finally, depending on the field, it would take an increase in production of three to 17 times for both males and females to reach parity in terms of their proportion to the population in their age cohort. It seems clear that Chicana and Chicano doctoral recipients are critically underrepresented in all fields.

Baccalaureate Origins and Doctorate-granting Institutions

California's role in producing Chicana and Chicano scholars was explored by examining where they earned their baccalaureate and doctoral degrees. Four patterns emerged from the NRC data: California undergraduate institutions produce the largest share of Chicano and the second-largest share of Chicana students who go on to receive doctorates; within the state, the California State University system produces the largest number of these future doctorates; California doctoral institutions produce the largest share of Chicana and Chicano students in the United States; though the largest institutions in California — state as well as private — produce the largest share of baccalaureates and doctorates, some smaller or less urban institutions are supplying more than their size and location would have predicted.

Chicana and Chicano Ford Foundation Fellows in California

To explore the resources, barriers, and critical events Chicana and Chicano scholars experienced on their road to the doctorate, the investigator examined a small group of scholars who were awarded one of the most prestigious and selective fellowships in the United States: the Ford Foundation Minority Predoctoral, Dissertation, and Postdoctoral Fellowship.

The sample of 66 scholars provided a quantitative and qualitative portrait of the career paths of Chicanas and Chicanos through the educational pipeline. The respondents were primarily first-generation college students from working-class families who were born in the U.S. of parents who were U.S. citizens or permanent residents. They grew up in primarily bilingual Spanish/English homes during their elementary and high school years and attended public high schools, where they were in college preparatory programs.

One troubling finding was their frequent exposure to racial and gender discrimination during high school, college, and graduate studies, with women encountering greater discrimination than men at each of these educational points. Chicanas, moreover, experienced more frequent

would address the most significant resources and barriers that the Ford scholars voiced in the course of this study.

Recommendation for State Goals and Policy

- The state of California must recommit itself to increased high school graduation rates for Chicana and Chicano students.
- The state of California must recommit itself to recruiting, admitting, retaining, and graduating Chicana and Chicano students at all levels of higher education.
- The state of California must recommit itself to recruiting, retaining, and promoting Chicana and Chicano faculty in all segments of higher education.

Recommendations to Implement Policy

High School

- In order to increase the number of high school students who continue on to college, the state should establish a Chicana and Chicano High School Research Assistant Program to get students interested in academic research as a possible career.

As an incentive for their participation, high school faculty could be given pay differentials or stipends, class release time, and undergraduate or graduate student assistance. Moreover, high school students could be given a stipend, after-school and summer employment, and class credit.

- Make sure teachers and counselors are sensitive to strengths of Chicana and Chicano students and encourage them to consider college training for professional careers.
- Work with local colleges, community organizations, and businesses to expose students to college, professional careers, and role models. To that end, high school, community organizations, university, and business partnerships can be established to form after-school, Saturday, and summer research programs.
- Work with university outreach programs to provide college visitation trips throughout California.

Undergraduate College and University

- In order to increase the number of undergraduate students who continue on to graduate school, the state should establish a Chicana and Chicano Undergraduate Research Assistant Program at all three tiers of the California postsecondary education system.

As few students enter college with the goal of becoming college professors, faculty who teach undergraduate students are critical in producing the next generation of PhDs. Although research is not the primary function of the community colleges, programs at this level are especially important because this is where the vast majority of Chicana and Chicano students begin their college career. As an incentive for their participation, faculty could be given course release time, seed money for research, reduced overhead costs for extramural grants, or graduate assistants. Students could be given a wage, stipend, fee waiver, course credit, or have their program participation acknowledged in the college transcript.

- Provide adequate financial aid assistance in scholarships, grants, loans, and work-study for Chicana and Chicano undergraduate students.
- It is important to nurture the development of student academic and social support networks both on and off campus. These could be social, political, and discipline-specific clubs.
- Develop a human relations program that helps dispel the myths and stereotypes of Chicana and Chicano students and their communities. In the short term, this can take the form of an ethnic and gender studies requirement for all students who graduate from the university. However, in the long term, schools and departments must integrate their faculties and curricula with Chicana and Chicano professors, courses, content, and research.

Graduate School

- The state should establish a Chicana and Chicano Graduate Research Assistantship Program in each of the UC campuses to give more students the opportunity to conduct research and develop relationships with mentors.

As an incentive for departments and faculty, a formula might be devised that attaches increased funds for fellowships and graduate assistants to the number of Chicana and Chicano students recruited to and graduated from each department. Also, intramural research grants could be awarded to faculty who have concrete plans to employ Chicana and Chicano students on their projects. Moreover, university overhead charges on extramural grants could be reduced for faculty with explicit plans to include these students.

- Supply students with adequate financial assistance,

discrimination from teachers, counselors, administrators, and other students, and recounted disturbing accounts of racial and gender discrimination throughout their educational career.

Although these Chicana and Chicano students were a unique group of highly gifted scholars, they did not seem to get much encouragement from school personnel to go to college. Not surprisingly, given the findings above, the males seemed to get more encouragement to pursue higher education from both their teachers and fathers than did females.

Immediately after high school and during their undergraduate years, a large percentage of this group went to work part- or full-time. A sizable number of them mentioned their need to work to continue their studies. Sometimes, in fact, it was the hard work of manual labor and tedious jobs that pushed them into higher education. While many enrolled in four-year colleges immediately after high school, 45 percent of the men and 41 percent of the women in the sample attended a community college.

These scholars chose a particular undergraduate college because of the affordable tuition, financial aid package, friends going to college, and parental encouragement. Many in the sample changed majors at least once in their college career. When they finally settled on a major it was because they enjoyed the field, it fulfilled personal expectations, they excelled in coursework, they could explore ethnic and gender issues, and it prepared them for graduate school. Many of the respondents spoke of the positive experience of being involved in college student political organizations and minority student support programs.

As undergraduates, the barriers they had to overcome included their lack of preparation and skills, their difficulty with "weeder" or "filter" courses (i.e., those that students must take and pass with a certain grade to stay in the major), lack of financial support, lack of information on graduate school, lack of Chicana and Chicano role models, family responsibilities, being stigmatized as an affirmative action student, and experiences with racial and gender discrimination.

On the other hand, the scholars spoke of positive mentoring relationships, research experiences, and encouragement from certain faculty, peers, and family as resources needed to finish their baccalaureate studies and continue on to graduate school.

Informants mentioned that they attended graduate school in order to grow intellectually, make a contribution to the field, contribute to the advancement of minorities and women, and attain occupational mobility.

Although their major sources of financial support during the coursework and dissertation stages of their graduate years came from scholarships, grants, loans, and work, only about four out of 10 of the subjects were engaged in what many feel is the most critical experience in graduate school: research assistantships.

When asked what they perceived to be the most important factors in obtaining a doctoral degree, the scholars cited university and other financial support, faculty advice on research and dissertation topics, and encouragement from fellow peers and their spouses. The single most important factor, however, was a positive mentoring experience. For many, this mentoring occurred among fellow students. Many also mentioned the opportunity to do hands-on research as another important factor in finishing their doctoral work. Finally, respondents spoke of their sense of indebtedness to scholars who preceded them in their fields and activists who came before them.

In contrast, the factors that most greatly interfered with their graduate work were burnout, personal problems, and lack of support from their dissertation chair. A number of both female and male Fellows mentioned their advisor, other faculty, or the department's refusal to recognize the legitimacy of their research as a major barrier they had to overcome in their graduate years.

Policy Recommendations

The following policy recommendations start from three basic premises:

1. One goal of social policy is to help the less fortunate and less powerful to achieve equity in society.

2. In a society that values truth and its pursuit, the inclusion of students and faculty with new ideas will not only benefit the Chicana and Chicano community, but will help in the expansion of knowledge and ultimately in California's social and economic development.

3. As meaningful interaction between people tends to break down interethnic and intergender stereotypes, positive interaction between faculty and Chicana and Chicano students at each stage in the educational pipeline is critical.

Implementation of the following recommendations

opportunities to present research at colloquia, opportunities to attend academic conferences, opportunities to form study and dissertation support groups, and support for the establishment of Chicana and Chicano graduate student organizations during the course-work and dissertation-writing stages.

- Provide an academic and social climate in which research related to race, ethnicity, and gender is encouraged and supported. To that end, if applicable, schools must support minority group and gender research.
- Sensitize the faculty to Chicana and Chicano student issues. Affirmative efforts must be taken to destroy the myths and stereotypes about minority students and faculty.

We do not know what potential new knowledge has not been developed because of the exclusion of Chicanas and Chicanos from California's higher education system, but may begin to understand the scope of our loss once we make a genuine commitment to breaking down barriers, abolishing policies of exclusion, and building on the strengths of Chicana and Chicano students. This study and the related policy recommendations begin to address that process.

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The research for this report was commissioned by the Latina/Latino Policy Research Program, which is funded by the University of California Office of the President and administered by the California Policy Seminar. The complete report is available free of charge to state government offices and for $12 to others. A check payable to UC Regents should accompany your order. Please address inquiries to the California Policy Seminar, 2020 Milvia, Suite 412, Berkeley, CA 94704, or telephone (510) 642-5514.